Fourier Transform Spectroscopy in the Soft X-Ray regime

Synchrotron radiation in the soft X-Ray range has become a powerful tool widely used in material science and chemical analysis. In many applications the traditional approach to its use is based on grating monochromator systems but the need for higher throughput and extreme spectral resolution together with some recent progresses in optical fabrication boost the adoption of non-dispersion-based designs.

Interferometry offers many advantages which have been used so far only in the infrared (FT-IR) and visible region of the spectrum (Fabry-Perot etalons). After the introduction of interferometric techniques at hard X-ray wavelengths some systems have been developed for EUV applications but no instrument has yet succeeded to perform spectroscopy in this range.

A soft X-ray spectrometer with a predicted resolving power of 10^6 is under construction at the Advanced Light Source. Its target is to perform photo-absorption experiments in the region of the double ionization threshold of Helium (60-80 eV). The constraints in the practical realization of an ultraviolet spectrometer will be discussed together with the design characteristics of the ALS FT-SX apparatus.